



DEFENSE LOGISTICS AGENCY

LAND AND MARITIME
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March 14, 2017

MEMORANDUM FOR MILITARY/INDUSTRY DISTRIBUTION

SUBJECT: Engineering Practices Study, Survey to Determine Future for MIL-PRF-85045/8 (Modify Optical Testing Requirements, Remove Qualification, or Cancel Document)
Project number 6015-2017-001.

An engineering practices study is being conducted to determine the future of MIL-PRF-85045/8. This specification sheet was originally written for an Army requirement, but we believe the Army used and continues to use their own drawing instead. There is only one known National Stock Number (NSN) for this specification sheet (6015-01-431-0431) for PIN D85045/8-B2A. Navy-SH is the preparing activity (PA) for the general specification, MIL-PRF-85045, and most of the specification sheets. However, we (DLA-CC) is the PA for this specification sheet. A copy of this letter is available for viewing and downloading from the DLA Land and Maritime-VA Web site:

<http://www.landandmaritimeapps.dla.mil/Programs/MilSpec/initialdrafts.aspx>

BACKGROUND

Navy-SH released revision G of the general specification in June 2014 with extensive changes. A major change during revision G was the introduction of new optical test requirements in MIL-STD-1678. We are the preparing activity for MIL-STD-1678 and we published the standard with the technical support of Navy-SH. The optical test requirements changed extensively. The major changes incorporated the following optical measurements:

MIL-STD-1678-2 Measurement 2102 (Change in Optical Transmittance)
MIL-STD-1678-2 Measurement 2202 (Optical Test Instrumentation)
MIL-STD-1678-2 Measurement 2203 (Launch Conditions)

The single qualified source, Optical Cable Corp. was not able to determine if their measurement methods met the MIL-STD-1678 requirements. We were not able to determine if their measurements met the new requirements and Navy-SH was not able to help either. Optical Cable Corp. has requested that we allow them to revert to the optical testing that was required in the F revision of MIL-PRF-85045 for their MIL-PRF-85045/8 testing.

We believe that we have three options for MIL-PRF-85045/8.

1. Revert to optical testing requirements from MIL-PRF-85045F,
2. Remove qualification, or
3. Cancel the specification sheet if no longer needed.

A listing of the optical test requirements from MIL-PRF-85045F and MIL-PRF-85045G are provided on the next page to help compare the requirements.

85045F

4.7.4 Optical properties inspections. Unless otherwise specified (see 3.1), the optical requirements specified herein shall be met at the center wavelength of 1.300 rtm with a plus or minus 0.020 rtm tolerance.

4.7.4.1 Attenuation rate (see 3.5.1). The multimode fiber attenuation rate shall be measured in accordance with EIA/TIA-455-46. For multimode fibers, the source shall be noncoherent. Light launch conditions used during the attenuation rate measurements shall be made in accordance with EIA-455-50 and table X. The attenuation rate of each individual single mode fiber shall be measured in accordance with EIA/TIA-455-78.

TABLE X. Light Launch conditions for attenuation rate tests.

Fiber Type	Launch conditions
SM	30-mm diameter mandrel
MM	70/70 restricted or equivalent

4.7.4.2 Change in optical transmittance (see 3.5.2). This test shall evaluate the change in optical transmittance of the fibers due to exposure of the cable to one or more inspection (environment and physical) tests.

4.7.4.2.1 Method. The change in optical transmittance of each fiber shall be measured in accordance with TIA/EIA-455-20, utilizing a monitor fiber to evaluate the change in transmittance due to exposure of the cable to environmental and physical tests. Any optical power detection method may be utilized if the method has the sensitivity to measure the differential optical power levels as specified in the individual mechanical test requirements of section 3, and if the method provides repeatable readings (less than 3 percent variation). A pretest optical power measurement shall be made and the specimen shall then undergo inspection testing. All optical power measurements, subsequent to the pretest measurement, shall be referenced to the pretest value and the change in dB calculated.

4.7.4.2.2 Guidelines. These types of measurements require highly stable optical devices (source and detector) and repeatability of loss at the device-to-fiber interface. Use of the same reference fiber for calibrating the light source power output just prior to making all the measurements on the cable specimen, will enhance the measurement accuracy.

4.7.4.3 Crosstalk (see 3.5.3). Fully assembled cable specimens shall be tested for crosstalk in accordance with EIA/TIA-455-42. When applicable, the crosstalk shall be determined between a minimum of three randomly selected fibers in a multi-fiber cable, using each selected fiber sequentially as the actively transmitting element, and measuring the far-end power output of all other fibers in the cable specimen. The center wavelength shall be 1.300 rtm $\pm$ 0.020 rtm, and the light launch conditions shall be as specified (see 4.7.4.1).

85045G

4.7.4 Optical properties inspections. Unless otherwise specified (see 3.1), the optical requirements specified herein shall be met at the center wavelength of 1.300 $\pm$ 0.020 micrometers tolerance.

4.7.4.1 Attenuation rate (see 3.5.1). The attenuation rate of each individual fiber in the cable shall be measured in accordance with Measurement 2106 of MIL-STD-1678-2.

4.7.4.1.1 Attenuation rate (for type I fiber only). Light launch conditions utilizing beam optics are preferred.

4.7.4.1.2 Attenuation rate (for type II fiber only). Light launch conditions shall utilize a higher order mode filter as cited in Measurement 2106 of MIL-STD-1678-2.

4.7.4.2 Change in optical transmittance (see 3.5.2). This test shall evaluate the change of optical power (transmittance) level of the fibers in the cable due to exposure to one or more inspection (mechanical and environmental) tests. The wavelength tested shall be as specified in the applicable specification sheet (see 3.1). The periodicity of the measurement shall be appropriate for the test method (see applicable measurement in MIL-STD-1678-3).

4.7.4.2.1 Method. The change in optical transmittance shall be measured during and after the test (from a baseline obtained before each test) in accordance with Measurement 2102 of MIL-STD-1678-2 for transmitted power, adhering strictly to the setup and test procedure specified.

4.7.4.3 Crosstalk (see 3.5.3). Fully assembled cable specimens shall be tested for crosstalk in accordance with Measurement 2106 of MIL-STD-1678-2. When applicable, the crosstalk shall be determined between a minimum of three randomly selected fibers in a multi-fiber cable, using each selected fiber sequentially as the actively transmitting element, and measuring the far-end power output of all other fibers in the cable specimen. The center wavelength shall be 1.300 $\pm$ 0.020 micrometers, and the light launch conditions shall be as specified (see 4.7.4.1).

REQUEST FOR COMMENTS

Please provide comments to help us decide the best outcome for this specification sheet. Should we:

1. Revert to optical testing requirements from MIL-PRF-85045F
2. Remove qualification,
3. Cancel the specification sheet, or
4. Any other comments or suggestions.

Comments are required at this Center no later than 30 days from the date of this letter. The point of contact for this document is Mr. Ken Beymer, DLA Land and Maritime, VAT, P. O. Box 3990, Columbus, OH 43218-3990. The preferred method of contact is via e-mail: ken.beymer@dla.mil. Mr. Beymer can also be reached at (614) 692-0557/DSN 850-0557, or by facsimile (614) 692-6939.

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